

Appl. No. 10/706,074
Amdt dated February 28, 2007
Reply to Office Action of December 1, 2006
Att. Docket No.: 1279-339D1

Filing date: November 12, 2003
Applicant Name: V. Reggie Edgerton
Examiner: Nguyen, Huong Q
Art Unit: 3736

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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 27 (canceled)

Claim 28 (currently amended): A method for assisting and easing the rehabilitation of a patient with an injury affecting locomotion, including spinal cord, stroke, and or traumatic brain injuries injured people (as well as others with injury affecting locomotion) to regain walking capabilities comprising the steps of:

- (a) providing an individually adjustable automated body weight suspension training system;
- (b) adjusting said training system to an individual's legs;
- ~~(b) c)~~ (c) operating multiple sensors wherein said sensors provide feedback, to adjust the automated body weight suspension training system, and
- (d) correcting pressure and guidance to said individual.

Claim 29 (original): The method of claim 28 further comprising the steps of:

- (a) utilizing two pairs of motor-driven mechanical linkage units;
- (b) having each of said units with two mechanical degrees-of-freedom;
- (c) connecting said units with their drive elements to a fixed base of a treadmill;
- (d) attaching said linkages' free ends the patient's legs at two locations at each leg;
- (e) serving one leg in the sagittal plane of bipedal locomotion with a first linkage pair;
- (f) serving the other leg in the sagittal plane of bipedal locomotion with a second linkage.

Claim 30 (currently amended): The method of claim 28 further comprising the step steps of:

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(a) providing a treadmill; and
(a b) providing and adjusting an exoskeleton linkage system over the treadmill
with its passive compliant elements to in contact with each of an individual
patient's geometry and dynamics legs.

Claim 31 (currently amended): The method of claim 28 30 further comprising the step
steps of

- (a) arranging said linkage system;
- (b) reproducing the a profile of bipedal locomotion; and
- (c) standing in the a sagittal plane, from a fixed base.

Claim 32 (currently amended): The method of claim 28 30 further comprising the steps
of:

- (a) controlling ~~, with a computer-based control system,~~ a programmable stepping
device with a computer-based control system;
- (b) controlling ~~, with a computer-based control system,~~ a linkage system of the
programmable stepping device with the computer-based control system;
- (c) referencing said control system to individual stepping models, treadmill speed,
and force, torque, electromyogram (EMG) and acceleration data;
- (d) sensing said data at the linkages' exoskeleton contact area with each of the
patient's legs.

Claim 33 (currently amended): The method of claim 28 30 further comprising the steps
of:

- (a) providing the exoskeleton with a computer control system;
- (a b) providing control algorithms of for the exoskeleton linkages' computer
control system ;
- (b c) utilizing said control algorithms for "intelligent" control for biped
locomotion wherein said algorithms distinguish between the amount and direction
of the force/torque generated by the patient, by ~~the feet's~~ contact of the patient's

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feet with the treadmill, and by the action of ~~the~~ a programmable stepping device;
and
(e-d) monitoring and controlling each leg independently.

Claim 34 (currently amended): The method of claim 28 32 further comprising the steps of:

- (a) operating said control system by way of feedback through sensors for force, torque, acceleration, and pressure located at various points on or in the exoskeleton linkage system;
- (b) requiring no wires to attach to the human body.

Claim 35 (currently amended): The method of claim 28 in which the body weight suspension training system includes a treadmill and means for supporting body weight over the treadmill further comprising the step of:

attaching a keyboard to the treadmill wherein ~~the user, one or more, selected from the group consisting of a patient, therapist, physician and or assistant~~ can input selected kinematic and dynamic stepping parameters to ~~said~~ a computer-based control system.

Claim 36 (original): The method of claim 28 further comprising the step of:

utilizing an external digital monitor system wherein the patient's stepping performance is selectively displayed in real time.

Claim 37 (original): The method of claim 28 further comprising the step of:

utilizing a data recording system wherein the storage of all training related and time based and time coordinated data, including electromyogram (EMG) signals, for off-line diagnostic analysis is enabled.

Claim 38 (original): The method of claim 28 further comprising the steps of:

- (a) minimizing an external mechanical load acting on the patient;

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(b) maximizing work performed by the patient in generating effective stepping and standing during treadmill training.

Claim 39 (currently amended): The method of claim 28 further comprising the steps of:

(a) applying stimulation to selected flexor muscles and extensor muscles and associated tendons [;] .

~~(b) applying stimulation to selected extensor muscles and associated tendons.~~

Claim 40 (original): The system of claim 39 further comprising the step of vibrating said selected flexor and extensor muscles and associated tendons for said stimulation.

Claim 41 (original): The method of claim 28 further comprising the step of: positioning, actively, the hips.

Claim 42 (original): The method of claim 28 further comprising the step of: controlling, actively, the hips with dual T-bars.

Claim 43 (original): The method of claim 28 further comprising the step of: controlling, actively, the hips with motorized semi-elastic belts.

Claim 44 (withdrawn): A method of using a system for assisting and easing the rehabilitation of spinal cord, stroke and traumatic brain injured people (as well as others with injury affecting locomotion) to regain walking capabilities comprising the steps of:

(a) fitting the patient into the attachment units for the patient's legs and adjusting the system for the patient's upper and lower leg lengths, body weight, height, and other parameters of fitting;

(b) fitting and adjusting the patient's hip restraints;

(c) fitting the stimulating units to the surface of desired flexor and extensor

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- (d) turning on the system and allowing it to move the patient's legs with any appropriate additional motion required for patient's hip s or upper body;
- (e) applying stimulation to the desired flexor and extensor muscle group areas at appropriate sequential times;
- (f) turning off the system and releasing patient from fittings and manually assisting patient from a treadmill.

Claim 45 (withdrawn): The method of using of claim 44 further comprising the step of:
stimulating selected flexor and extensor muscles and associated tendons.

Claim 46 (withdrawn): The method of using of claim 45 further comprising the step of:
applying vibration to stimulate said selected flexor and extensor muscles and associated tendons.

Claim 47 (withdrawn): The method of using of claim 45 further comprising the step of:
positioning, actively, the hips.

Claim 48 (withdrawn): The method of using of claim 45 further comprising the step of:
controlling, actively, the hips with dual T-bars.

Claim 49 (withdrawn): The method of using of claim 45 further comprising the step of:
controlling, actively, the hips with motorized semi-elastic belts.